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Dan Welsh

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EXAMINER

BOOSALIS, FANI POLYZOS

ART UNIT

PAPER NUMBER

2884

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/782,730

Applicant(s)

WELSH ET AL.

Examiner

Faye Boosalis

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5/26/05.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-8, 13-16, 26-30, 34-37 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by *Bertelsen et al* (US 5,608,221 A).

Regarding claim 1, Bertelsen discloses a method, comprising: obtaining a signal (1210) indicative of a detection by an electromagnetic detector (gamma ray detector) (80); comprising the signal to at least one criterion, the at least one criterion representing a characteristic of a signal, the characteristic indicative of whether the signal resulted from detection of a desired electromagnetic wave (valid event trigger signals) as being rejected and indicating a signal (CTC unit) (1050) when the comprising indicates that the signal did not result from detection of the desired electromagnetic wave (See Generally Fig. 1A and col. 7, lines 49-67 and col. 8, lines 1-14).

Regarding claim 2, Bertelsen discloses the method wherein the comparing comprises determining a multiplicity of events within the signal, and rejecting the signal if the number of events is outside a specific threshold (col. 11, lines 42-44).

Regarding claim 3, Bertelsen discloses the method wherein the signal is indicative of gamma ray detection by a gamma ray detector (80) (col. 7, lines 5-10).

Regarding claim 4, Bertelsen discloses the method wherein the criterion includes a threshold based on expected amounts of gamma ray detection during a specific procedure (col. 7, lines 20-32).

Regarding claim 5, Bertelsen discloses the method wherein the comparing comprises using a raw multiplicity filter, to reject signals when they do not have more than a specific number of events within a specific time (col. 42, lines 20-35).

Regarding claim 6, Bertelsen discloses the method wherein the comparing comprises using a global density filter, to reject signals when they do not have more than a specific number of events within a specific time (col. 9, lines 15-55).

Regarding claim 7, Bertelsen discloses the method wherein the comparing comprises using a local density filter to reject strings in a signal that have more than a specified number of events in the specified time (col. 9, lines 15-55).

Regarding claim 8, Bertelsen discloses the method wherein the comparing comprises using a raw multiplicity filter to reject signals when they have a size greater than a specific amount (col. 7, lines 20-32 and col. 42, lines 20-35).

Regarding claim 13, Bertelsen discloses the method wherein the obtaining a signal comprises storing the signal in a buffer along with an associated signal that represents whether the signal is complete (col. 23, lines 7-19).

Regarding claim 14, Bertelsen discloses the method comprising forming an image and excluding rejected signals from the image (col. 8, lines 53-67 and col. 9, lines 1-10).

Regarding claims 15-16, Bertelsen discloses the method comprising initially associating a second signal representing a valid signal with the signal, and using the comparing to change the second signal, digital, to a value representing an invalid signal when the comparing indicates that the signal did not result from detection of the desired electromagnetic wave (col. 22, lines 55-67 and col. 23, lines 1-6).

Regarding claim 26, Bertelsen discloses a system comprising: an electromagnetic detector (80), having a surface adapted to detect an electromagnetic wave, and producing an output signal indicative of a detection (col. 6, lines 65-67 and col. 7, lines 1-27); and a signal processor (CTC unit) (1050), including an electronic filter therein, which processes the output signal, using a filter characteristic that indicated whether the output signal resulted from detection of a desired electromagnetic phenomenon, and indicating signals as being rejected when they did not result from the detection of the desired electromagnetic phenomenon (See Generally Fig. 1A and col. 7, lines 49-67, col. 8, lines 1-14 and col. 42, lines 20-35).

Regarding claim 27, Bertelsen discloses the system wherein the electromagnetic detector (80) is a medical gamma ray detector (See Generally Fig. 1A and col. 7, lines 5-10).

Regarding claim 28, Bertelsen discloses the system comprising an image display (1065) which displays an image based on the output signal, including only signals that resulted from detection of the desired electromagnetic phenomenon (col. 8, lines 53-67 and col. 9, lines 1-10).

Regarding claim 29, Bertelsen discloses the system wherein the filter characteristic represents a multiplicity of events within the signals (col. 42, lines 20-35).

Regarding claim 30, Bertelsen discloses the system wherein the filter characteristic represents a density of events within the signal (col. 9, lines 15-55).

Regarding claim 34, Bertelsen discloses the system wherein the signal processor (CTC unit) (1050) includes a buffer therein which stores an electronic representation of the output signal, and stores a status signal indicative of whether the output signal is rejected (col. 23, lines 7-19).

Regarding claim 35, Bertelsen discloses a signal processor (CTC unit) (1050), comprising: an input portion, receiving a signal from a medical gamma ray detector (80); a signal processor portion, including an electronic filter therein which processes the signal from the medical camera ray detector to reject portions of the signal that did not result from detection of a desired electromagnetic phenomenon and produces an image output signal, representing an image based on at least one signal from the image portion which is not rejected by the signal processor portion (See Generally Fig. 1A and col. 7, lines 49-67, col. 8, lines 1-14, lines 53-67, col. 9, lines 1-10 and col. 42, lines 20-35).

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Regarding claim 36, Bertelsen discloses a signal processor (1050) wherein the electronic filter rejects signals based on a number of events within the signal (col. 42, lines 20-35).

Regarding claim 37, Bertelsen discloses a signal processor (1050) wherein the electronic filter rejects signals based on a density of events within the signal (col. 9, lines 15-55).

Regarding claim 41, Young discloses a method, comprising: determining, in a medical gamma ray system (10), a dose (radiopharmaceutical) and number of gamma ray signals which will be applied to a patient (16); receiving gamma rays from the patient as applied by the medical camera ray system; using the dose and number of gamma ray signals to form a filter (42) to filter out portions of the received to gamma rays that are outside a range that is based on the dose and number of gamma ray signals determined in the determining (col. 5, lines 33-50, col. 7, lines 56-67 and col. 8, lines 1-11).

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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4. Claims 17-23 are rejected under 35 U.S.C. 102(e) as being anticipated by *Berlad et al* (US 6,388,258 B1).

Regarding claim 17, Berlad discloses a method comprising: obtaining a first signal from an electromagnetic detector, indicative of a detection by the electromagnetic detector (col. 2, lines 20-34); associating a second signal with the first signal, the second signal having a first value which indicates that the first signal is valid (col. 11, lines 34-42); processing the value of the first signal, to determine whether the first signal represents a desired event being monitored (col. 11, lines 43-50); and changing the second signal to a second value when the processing indicates that the electromagnetic detector signal represents an event other than a desired observed event (col. 11, lines 53-67 and col. 12, lines 1-5).

Regarding claim 18, Berlad discloses the method wherein the electromagnetic detector signal is a signal from a gamma ray detector, and the desired observed event is a clinical gamma ray imaging application (col. 2, lines 1-15 and lines 21-34).

Regarding claim 19, Berlad discloses the method wherein the processing represents filtering the signal to remove events within the signal representing noise (col. 1, lines 59-63 and col. 11, lines 34-39).

Regarding claim 20, Berlad discloses the method comprising forming a medical image using only first signals which have associated second signals in the first state (col. 11, lines 34-50).



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Regarding claim 21, Berlad discloses the method wherein the filtering comprises determining if a number of events occurring within the first signal is outside of a specified threshold (col. 11, lines 34-50).

Regarding claim 22, Berlad discloses the method wherein the filtering comprises determining if an amount of detection is outside a specified threshold (col. 13, lines 6-25).

Regarding claim 23, Berlad discloses the method wherein the filtering comprises determining if a density of events within the first signal is outside a specified threshold (col. 4, lines 50-64 and col. 5, lines 1-10).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Bertelsen et al (US 5,608,221 A)*, as applied to claim 4 above, and further in view of *Hounsfield et al (US 3,932,757)*.

Regarding claim 7, Bertelsen discloses a method, comprising: obtaining a signal (1210) indicative of a detection by an electromagnetic detector (gamma ray detector) (80); comprising the signal to at least one criterion, the at least one criterion representing a characteristic of a signal, the characteristic indicative of whether the signal resulted from detection of a desired electromagnetic wave

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(valid event trigger signals) as being rejected and indicating a signal (CTC unit) (1050) when the comprising indicates that the signal did not result from detection of the desired electromagnetic wave (See Generally Fig. 1A and col. 7, lines 49-67 and col. 8, lines 1-14). Bertelsen does not disclose using a local density filter to prevent multiple events in a specified time. Hounsfield discloses method wherein the comparing comprises using a local density filter to reject strings in a signal that have more than a specified number of events in a specified time (claim 6). Hounsfield teaches density filters provide an intensity distribution of energy across the broad lines, and utilize the signals which do not exceed the threshold to control the strength of the energy from the further sources of the one wavelength as incident on the screen device and for utilizing the signals in excess of the threshold to control the strength of the energy from the further sources of the other wavelength as incident on the screen device (See claim 6). Therefore, it would have been obvious to modify the method suggested by Bertelsen, to include local density filter, as disclosed supra by Hounsfield, to allow for improved means of electromagnetic detection.

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Bertelsen et al* (US 5,608,221 A), as applied to claim 4 above, and further in view of *Gaussa, Jr. et al* (US 4,920,548).

Regarding claim 9, Bertelsen discloses a method, comprising: obtaining a signal (1210) indicative of a detection by an electromagnetic detector (gamma ray detector) (80); comprising the signal to at least one criterion, the at least one criterion representing a characteristic of a signal, the characteristic indicative of

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whether the signal resulted from detection of a desired electromagnetic wave (valid event trigger signals) as being rejected and indicating a signal (CTC unit) (1050) when the comprising indicates that the signal did not result from detection of the desired electromagnetic wave (See Generally Fig. 1A and col. 7, lines 49-67 and col. 8, lines 1-14). Bertelsen does not disclose using an average energy filter. Gauss discloses a method wherein the comparing comprises using an average energy filter that rejects signals based on a comparison to a specified average energy threshold (See Abstract). Gauss teaches statistical filter compares the current pulse count rate signal to maximum and minimum statistical limits generated from the recent average value of the pulse count rate using Poisson statistics, and clamps the output to the limit which is exceeded. If the pulse count rate is between the statistical limits, it is used as the output pulse count rate signal. If the statistical limits are exceeded for a designated interval indicative of a true change in the pulse count rate, clamping of the output signal is overridden so that the true change in pulse count rate can be tracked. Statistical filtering is resumed when the current pulse count rate is again within the statistical limits. Therefore, it would have been obvious to modify the method suggested by Bertelsen, to include an average energy filtering method, as disclosed supra by Gauss, to allow for improved means of electromagnetic detection.

8. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Bertelsen et al* (US 5,608,221 A), as applied to claim 3 above, and further in view of *Mitchell et al* (US 5,452,084 A).

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Regarding claim 10, Bertelsen discloses a method, comprising: obtaining a signal (1210) indicative of a detection by an electromagnetic detector (gamma ray detector) (80); comprising the signal to at least one criterion, the at least one criterion representing a characteristic of a signal, the characteristic indicative of whether the signal resulted from detection of a desired electromagnetic wave (valid event trigger signals) as being rejected and indicating a signal (CTC unit) (1050) when the comprising indicates that the signal did not result from detection of the desired electromagnetic wave (See Generally Fig. 1A and col. 7, lines 49-67 and col. 8, lines 1-14). Bertelsen does not disclose vibration energy. Mitchell discloses an electromagnetic spectrometry method wherein the comparing comprises determining a multiplicity of events within signals wherein the comparison comprises comparing the signal to a criterion that represents vibration energy (col. 3, lines 34-54 and col. 8, lines 56-65). Mitchell teaches since rotational/vibrational energy modes are quantized, when a photon strikes a particular gas, the energy exchange will be quantized. The quantization is species specific, i.e., each gas typically has different quantization of energy modes. By observing the frequency shift, or correspondingly the wavelength shift, of scattered photons, it is possible to identify the type of gas which a photon has struck. Gases which are more concentrated have a higher probability of being hit by an incident photon. Thus, by observing the quantity of each group of frequency shifted scattered photons, it is possible to determine the concentration of each gas within the sample (col. 8, lines 56-68 and col. 9, lines 1-2).

Therefore, it would have been obvious to modify the method suggested by

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Bertelsen, to include criterion that represents vibrational energy, as disclosed supra by Mitchell, to allow for improved means of electromagnetic detection.

Regarding to claim 11, Mitchell discloses a method wherein the comparing comprises comparing the signal to a criterion that represents a cosmic ray (col. 9, lines 41-47).

Regarding to claim 12, Mitchell discloses a method wherein the comparing comprises comparing the signal to a plurality of criterion that represent both vibration energy and a cosmic ray (col. 3, lines 34-54 and col. 8, lines 56-65 and col. 9, lines 41-47).

9. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Berlad et al* (US 6,388,258 B1) as applied to claim 18 above, and further in view of *Mitchell et al* (US 5,452,084 A).

Regarding claims 24-25, Berlad discloses a method comprising: obtaining a first signal from an electromagnetic detector, indicative of a detection by the electromagnetic detector (col. 2, lines 20-34); associating a second signal with the first signal, the second signal having a first value which indicates that the first signal is valid (col. 11, lines 34-42); processing the value of the first signal, to determine whether the first signal represents a desired event being monitored (col. 11, lines 43-50); and changing the second signal to a second value when the processing indicates that the electromagnetic detector signal represents an event other than a desired observed event (col. 11, lines 53-67 and col. 12, lines 1-5). Berlad does not disclose comparing the signal to a criterion representing vibrational energy or a cosmic ray. Mitchell discloses an electromagnetic

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spectrometry method wherein the comparing comprises determining a multiplicity of events with in signals wherein the comparison comprises comparing the signal to a criterion that represents vibration energy (col. 3, lines 34-54 and col. 8, lines 56-65). Mitchell teaches since rotational/vibrational energy modes are quantized, when a photon strikes a particular gas, the energy exchange will be quantized.

The quantization is species specific, i.e., each gas typically has different quantization of energy modes. By observing the frequency shift, or correspondingly the wavelength shift, of scattered photons, it is possible to identify the type of gas which a photon has struck. Gases which are more concentrated have a higher probability of being hit by an incident photon. Thus, by observing the quantity of each group of frequency shifted scattered photons, it is possible to determine the concentration of each gas within the sample (col. 8, lines 56-68 and col. 9, lines 1-2). Mitchell also discloses a method wherein the comparing comprises comparing the signal to a criterion that represents a cosmic ray (col. 9, lines 41-47). Mitchell teaches a source of background noise in the measured signal is inherent photodetector dark noise, or dark current. Dark noise is due to random thermal excitation of electrons within detector, as well as excitation by cosmic rays and radioactive bombardment. Photodetector dark noise also results in background noise in the measured signal (col. 9, lines 41-47). Therefore, it would have been obvious to modify the method suggested by Berlad, to include criterion that represents vibrational energy and to include signals representing a cosmic ray to represent an invalid associated signal, as

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disclosed supra by Mitchell, to allow for improved means of electromagnetic detection.

10. Claims 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Bertelsen et al* (US 5,608,221 A), as applied to claim 27 above, and further in view of *Thurston et al* (US 6,222,193 B1).

Regarding claim 31, Bertelsen discloses the system wherein the electromagnetic detector (80) is a medical gamma ray detector (See Generally Fig. 1A and col. 7, lines 5-10). Bertelsen does not disclose of incoming cosmic rays. Thurston discloses a surgical electromagnetic detecting system wherein the filter characteristic represents a characteristic of incoming cosmic rays (col. 18, lines 50-67 and col. 19, lines 1-21). Thurston teaches the incoming signals, additionally, may represent spurious phenomena, such as cosmic rays and the like, and for sentinel node identification applications, the incoming signals also typically will include a Compton scattering form of noise. Accordingly, the energies of the incoming signals are evaluated at the energy window network. The lower threshold comparator function will promulgate a pulse at line when the signal asserted thereat exhibits an amplitude of value equal to or above a threshold value established, as noted above, from line (478) (col. 18, lines 58-67). Therefore, it would have been obvious to modify the method suggested by Bertelsen, to include criterion that represents vibrational energy, as disclosed supra by Thurston, to allow for improved means of electromagnetic detection.

Regarding claim 32, Bertelsen discloses the system wherein the filter characteristic represents a characteristic of electromagnetic interference (col. 26, lines 21-43).

Regarding claim 33, Thurston discloses a surgical electromagnetic detecting system wherein the filter characteristic represents a characteristic of mechanical vibration (66)(68)(col. 4, lines 35-52 and col. 9, lines 2-19).

11. Claims 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Bertelsen et al* (US 5,608,221 A), as applied to claim 35 above, and further in view of *Thurston et al* (US 6,222,193 B1).

Regarding claim 38, Bertelsen discloses a signal processor (CTC unit) (1050), comprising: an input portion, receiving a signal from a medical gamma ray detector (80); a signal processor portion, including an electronic filter therein which processes the signal from the medical camera ray detector to reject portions of the signal that did not result from detection of a desired electromagnetic phenomenon and produces an image output signal, representing an image based on at least one signal from the image portion which is not rejected by the signal processor portion (See Generally Fig. 1A and col. 7, lines 49-67, col. 8, lines 1-14, lines 53-67, col. 9, lines 1-10 and col. 42, lines 20-35). Bertelsen does not disclose of incoming cosmic rays. Thurston discloses a signal processor wherein the filter characteristic represents a characteristic of incoming cosmic rays (col. 18, lines 50-67 and col. 19, lines 1-21). Thurston teaches the incoming signals, additionally, may represent spurious phenomena, such as cosmic rays and the like, and for sentinel node identification applications,



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the incoming signals also typically will include a Compton scattering form of noise. Accordingly, the energies of the incoming signals are evaluated at the energy window network. The lower threshold comparator function will promulgate a pulse at line when the signal asserted thereat exhibits an amplitude of value equal to or above a threshold value established, as noted above, from line (478) (col. 18, lines 58-67). Therefore, it would have been obvious to modify the method suggested by Bertelsen, to include criterion that represents vibrational energy, as disclosed supra by Thurston, to allow for improved means of signal processing.

Regarding claim 39, Bertelsen discloses the signal processor wherein the filter filters out signals which have characteristic representing electromagnetic interference (col. 26, lines 21-43).

Regarding claim 40, Thurston discloses the signal processor wherein the filter characteristic represents a characteristic of mechanical vibration (66)(68)(col. 4, lines 35-52 and col. 9, lines 2-19).

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Faye Boosalis whose telephone number is 571-272-2447. The examiner can normally be reached on Monday thru Friday from 7:30 AM to 4:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FB



**OTILIA GABOR**  
**PRIMARY EXAMINER**